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PATENT

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Blanset et al.

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Serial No.: 09/735,093

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Filed: 12/12/2000
For: SYSTEM AND METHOD FOR AUTOMATICALLY CONFIGURED CROSS-CONNECTIONS IN A DIGITAL SUBSCRIBER LINE ACCESS MULTIPLEXER (DSLAM)

Commissioner of Patents and Trademarks
Washington, D.C. 20231

TRANSMITTAL OF FORMAL DRAWINGS PRIOR TO NOTICE OF ALLOWANCE

Attached please find the formal drawings for this application that have been corrected to comply with 37 CFR 1.184 (18 Pages).

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CERTIFICATE OF MAILING (37 CFR 1.8)

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Date: 4-4-01

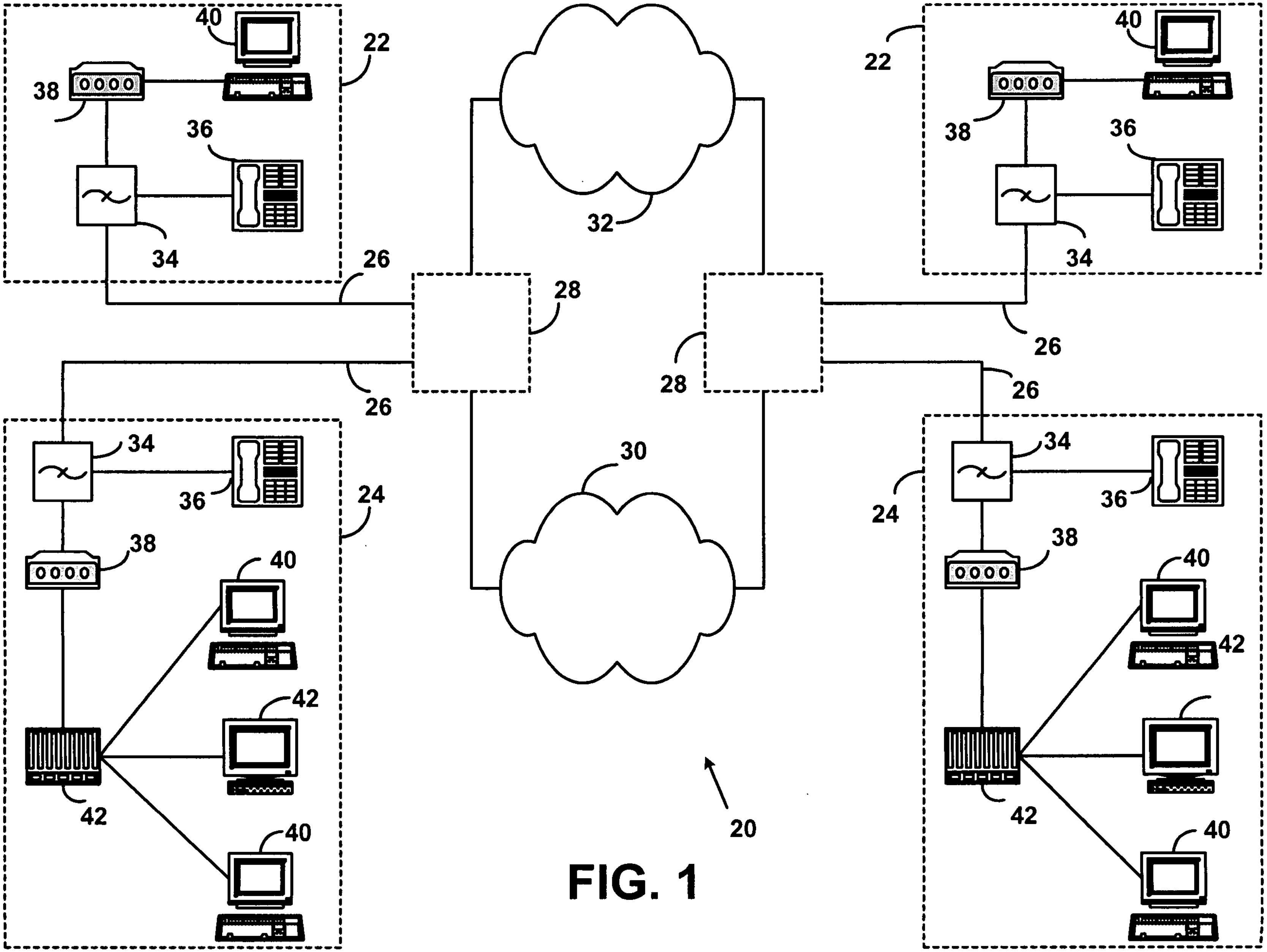

FIG. 1

1818
#3

22

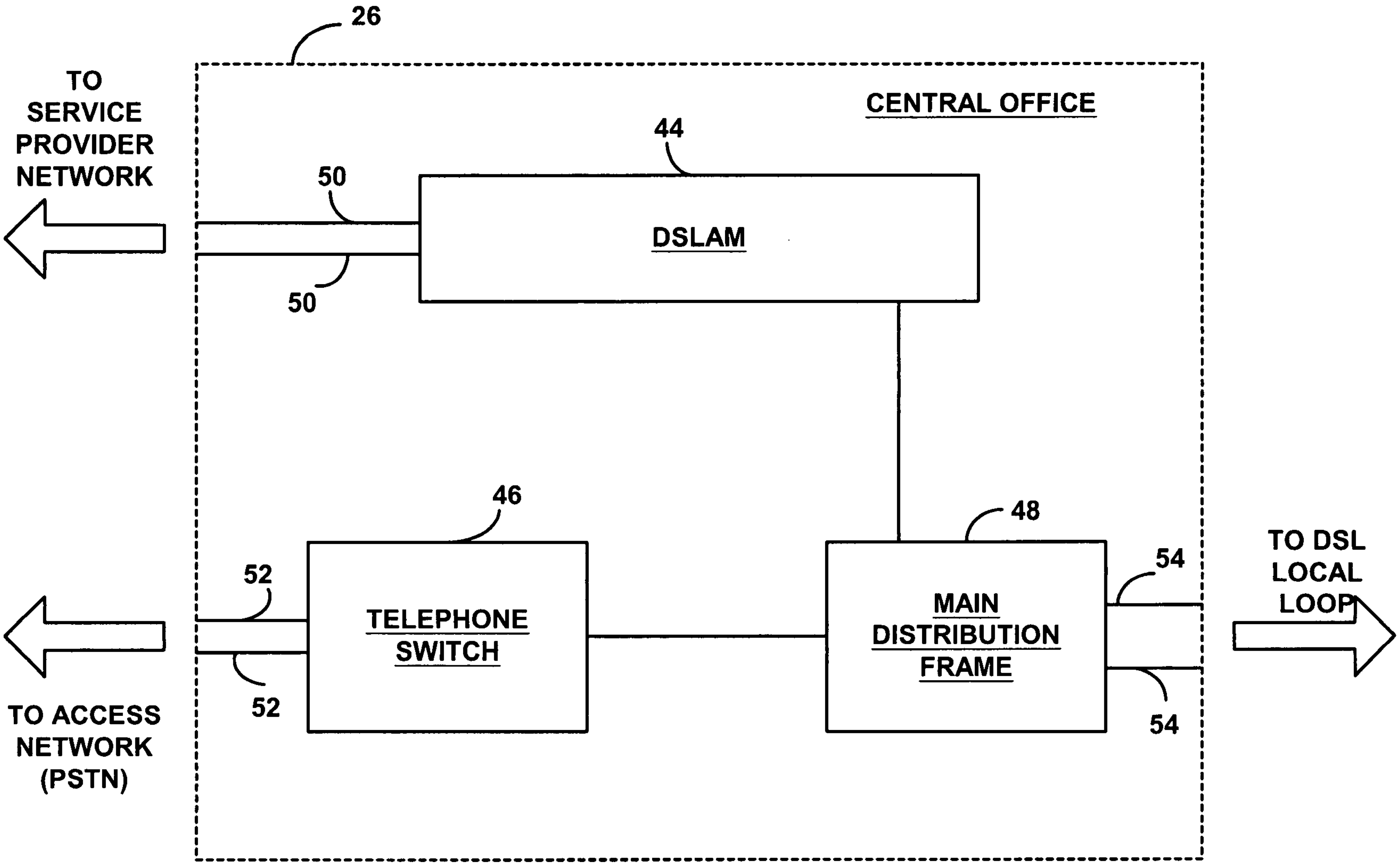
26
TO SERVICE PROVIDER NETWORK
CENTRAL OFFICE
44
DSLAM
50
50
46
TELEPHONE SWITCH
52
52
TO ACCESS NETWORK (PSTN)
48
MAIN DISTRIBUTION FRAME
54
54
TO DSL LOCAL LOOP

FIG. 2

2818

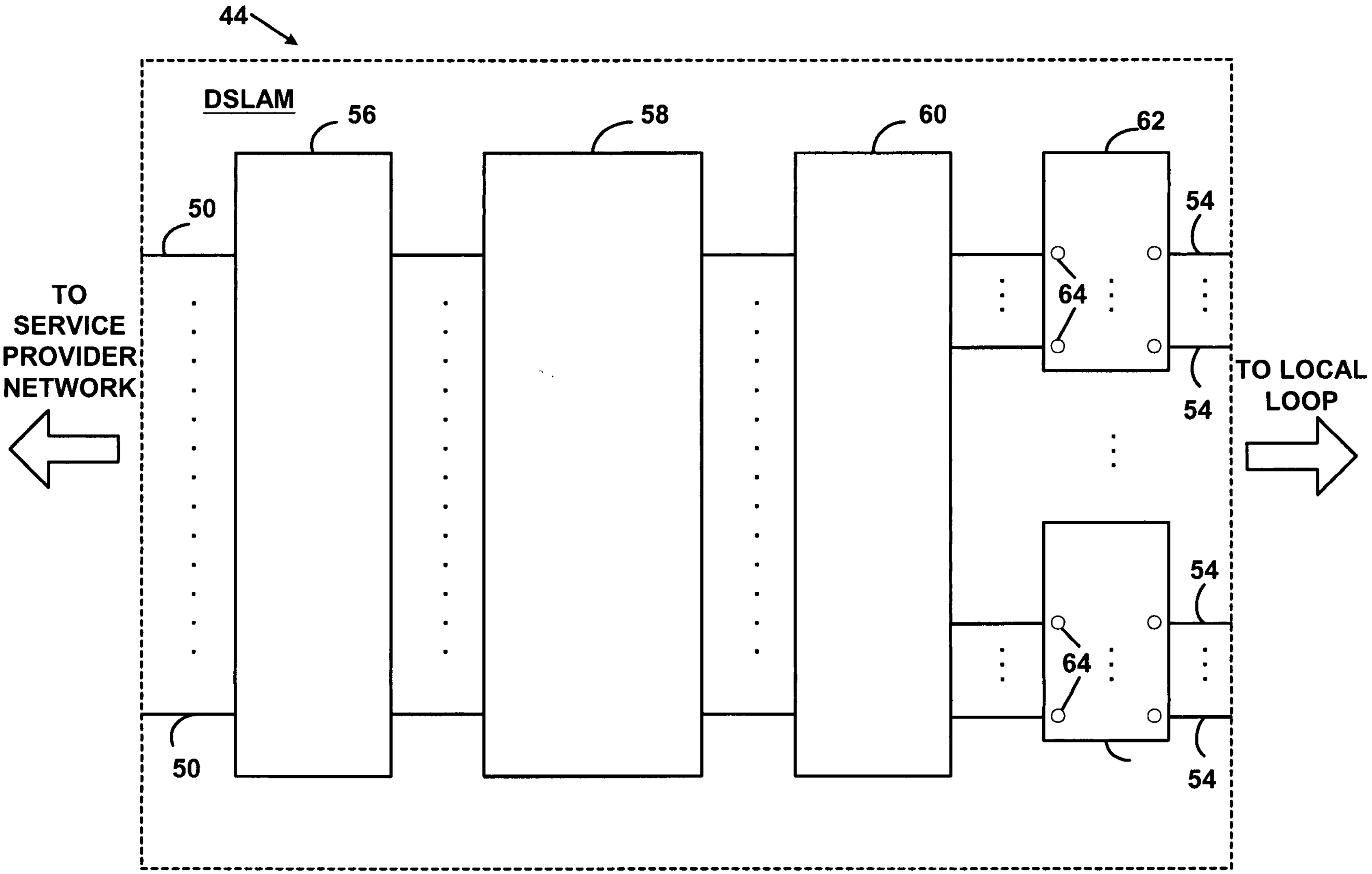
44
DSLAM
56
58
60
62
50
50
TO SERVICE PROVIDER NETWORK
54
54
54
54
64
64
TO LOCAL LOOP

FIG. 3

3818

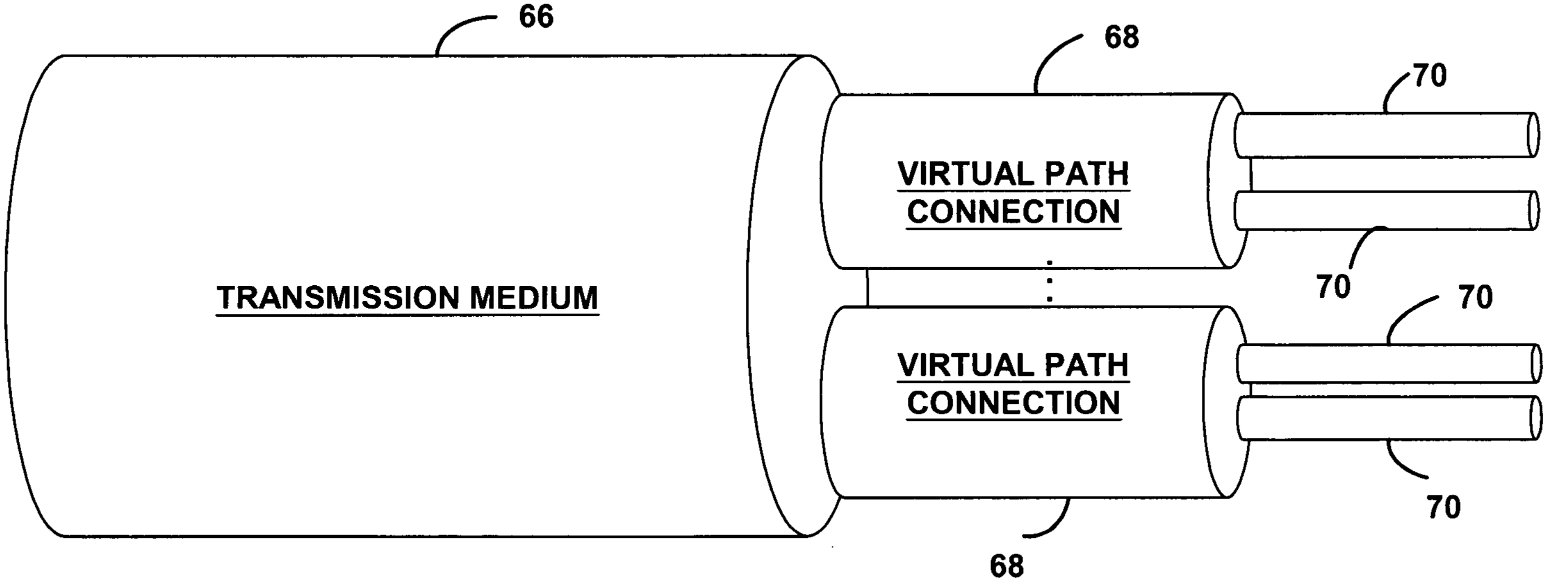
66
TRANSMISSION MEDIUM
68
VIRTUAL PATH CONNECTION
70
70
70
VIRTUAL PATH CONNECTION
70
68

FIG. 4

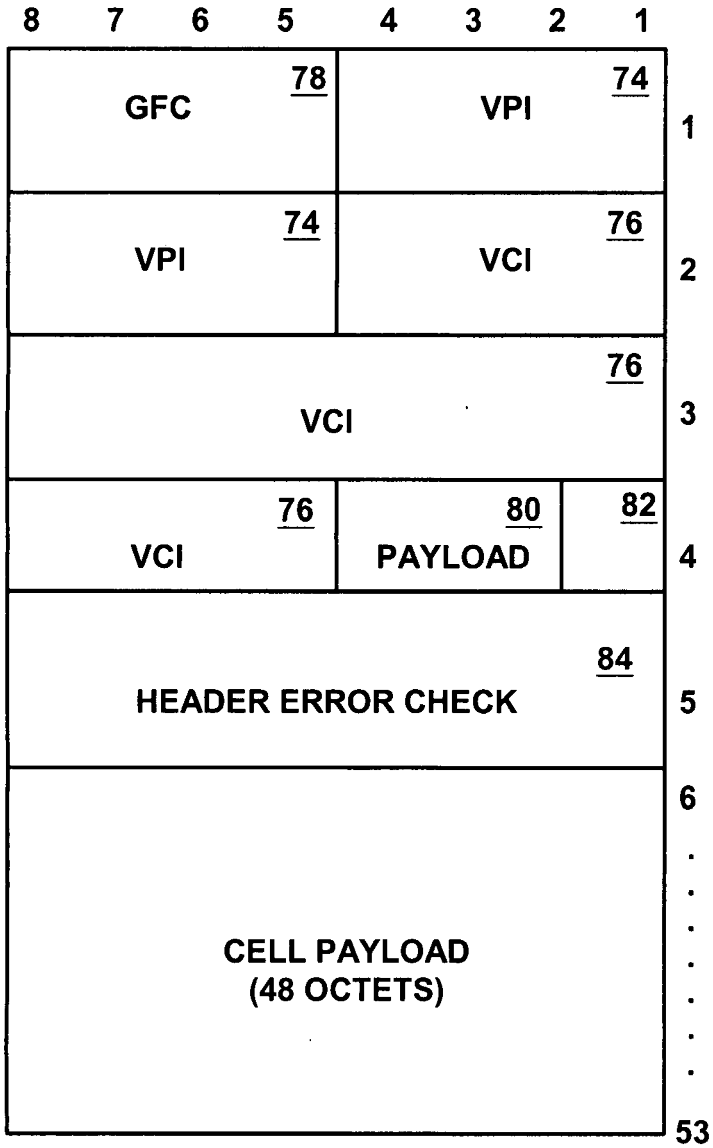
8
7
6
5
4
3
2
1
GFC
78
VPI
74
VPI
74
VCI
76
VCI
76
VCI
76
PAYLOAD
80
82
HEADER ERROR CHECK
84
CELL PAYLOAD
(48 OCTETS)
1
2
3
4
5
6
53
(BITS)
(BYTES)

FIG. 5

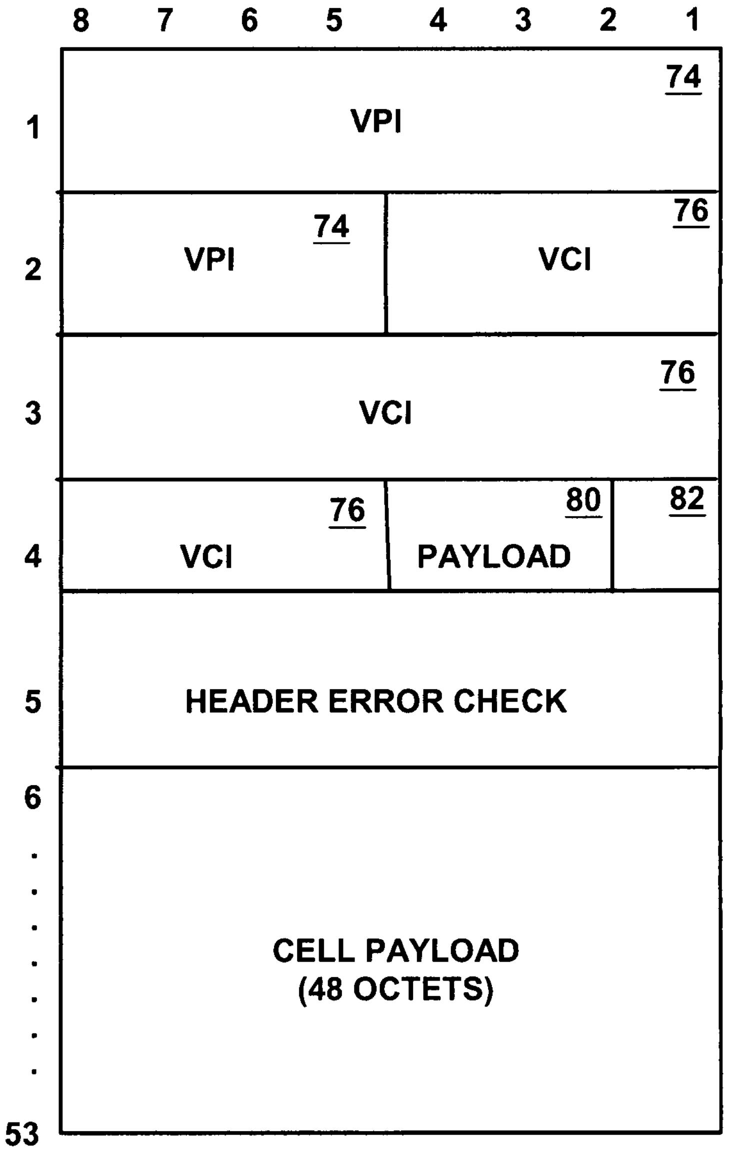
8
7
6
5
4
3
2
1
VPI
74
VPI
74
VCI
76
VCI
76
VCI
76
PAYLOAD
80
82
HEADER ERROR CHECK
CELL PAYLOAD
(48 OCTETS)
1
2
3
4
5
6
53

FIG. 6

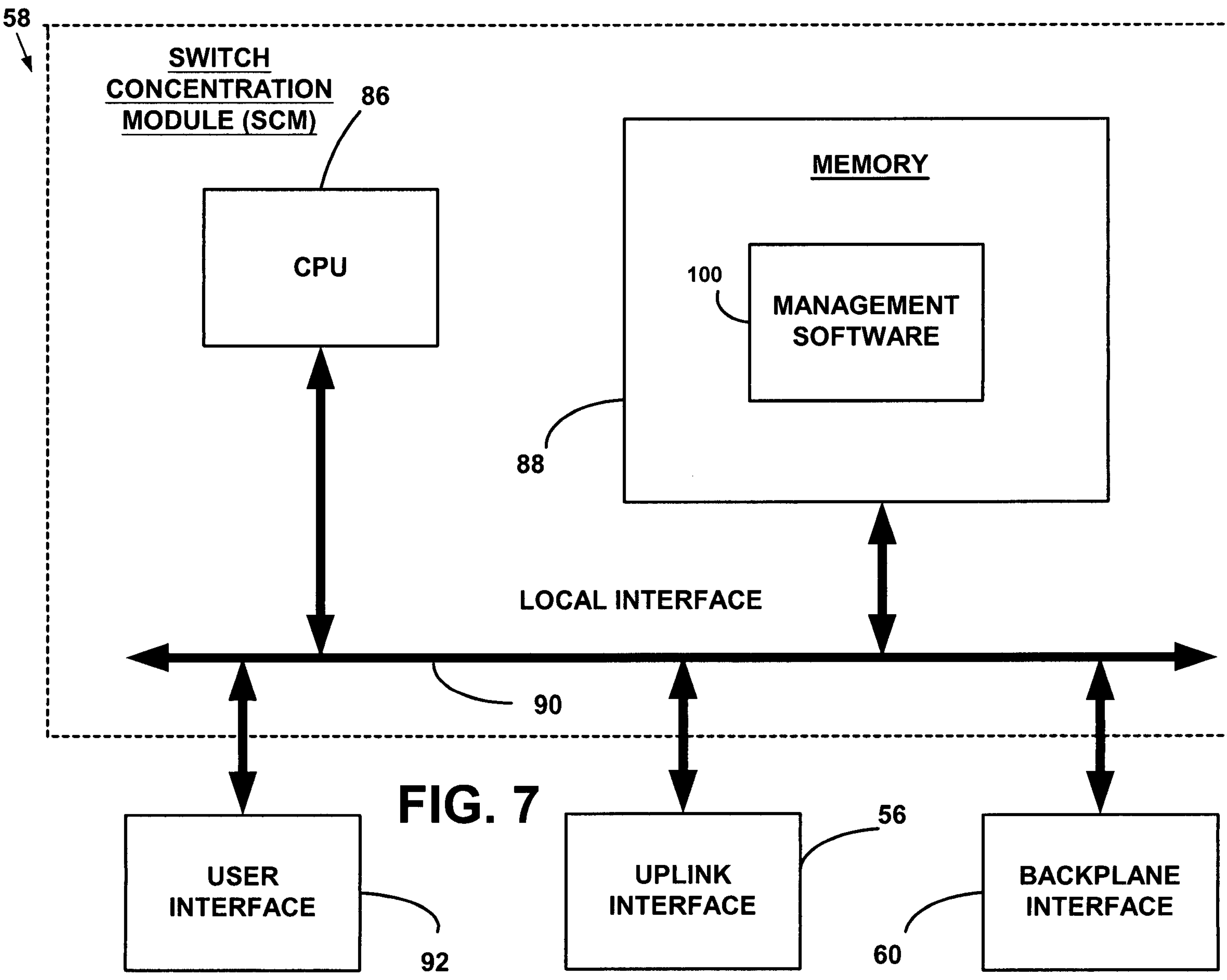
58
SWITCH
CONCENTRATION
MODULE (SCM)
86
CPU
MEMORY
100
MANAGEMENT
SOFTWARE
88
LOCAL INTERFACE
90
USER
INTERFACE
92
UPLINK
INTERFACE
56
BACKPLANE
INTERFACE
60

FIG. 7

6918

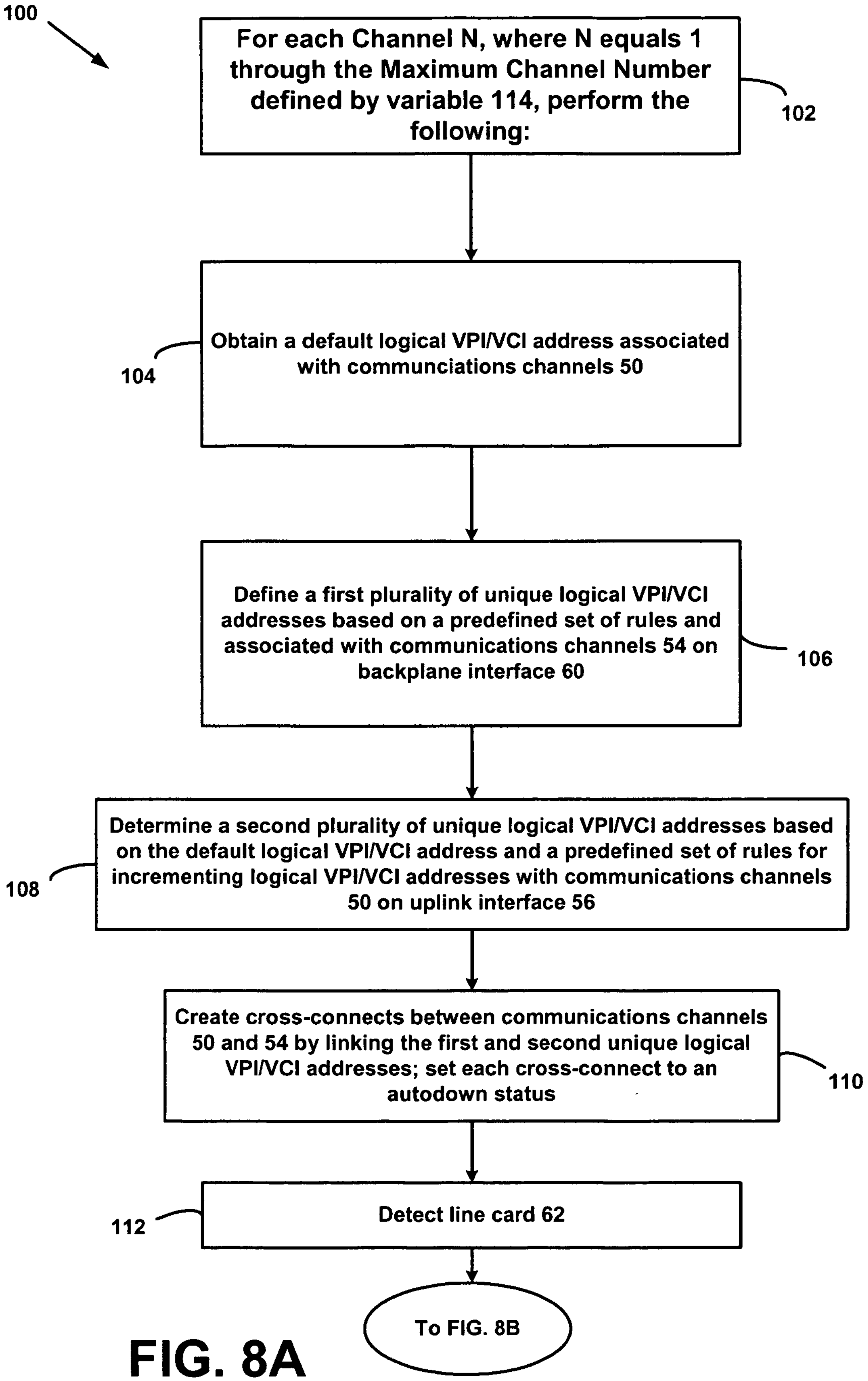
100
For each Channel N, where N equals 1 through the Maximum Channel Number defined by variable 114, perform the following:
102
Obtain a default logical VPI/VCI address associated with communciations channels 50
104
Define a first plurality of unique logical VPI/VCI addresses based on a predefined set of rules and associated with communications channels 54 on backplane interface 60
106
Determine a second plurality of unique logical VPI/VCI addresses based on the default logical VPI/VCI address and a predefined set of rules for incrementing logical VPI/VCI addresses with communications channels 50 on uplink interface 56
108
Create cross-connects between communications channels 50 and 54 by linking the first and second unique logical VPI/VCI addresses; set each cross-connect to an autodown status
110
Detect line card 62
112
To FIG. 8B

FIG. 8A

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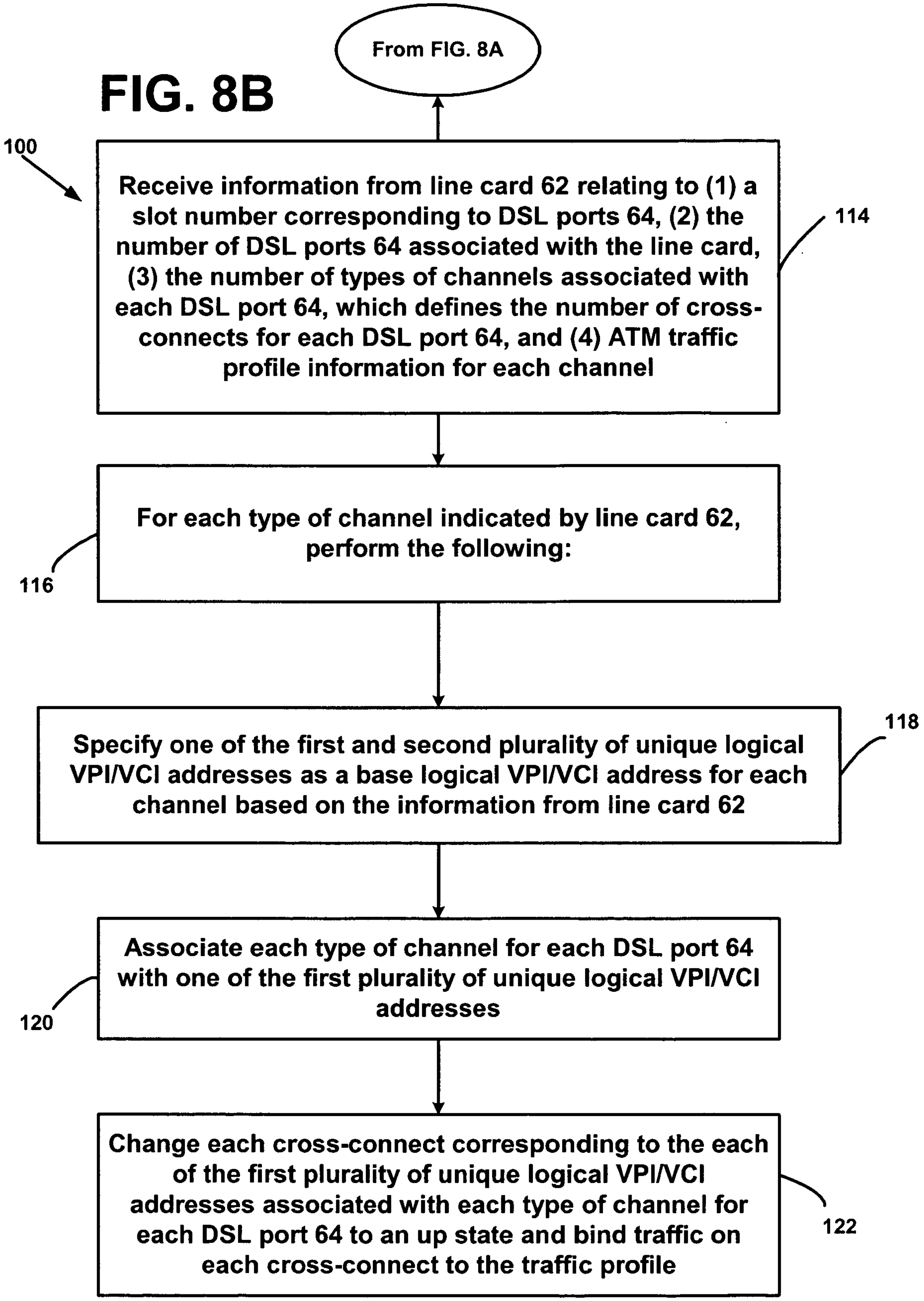
FIG. 8B


From FIG. 8A
100
Receive information from line card 62 relating to (1) a slot number corresponding to DSL ports 64, (2) the number of DSL ports 64 associated with the line card, (3) the number of types of channels associated with each DSL port 64, which defines the number of cross-connects for each DSL port 64, and (4) ATM traffic profile information for each channel
114
For each type of channel indicated by line card 62, perform the following:
116
Specify one of the first and second plurality of unique logical VPI/VCI addresses as a base logical VPI/VCI address for each channel based on the information from line card 62
118
Associate each type of channel for each DSL port 64 with one of the first plurality of unique logical VPI/VCI addresses
120
Change each cross-connect corresponding to the each of the first plurality of unique logical VPI/VCI addresses associated with each type of channel for each DSL port 64 to an up state and bind traffic on each cross-connect to the traffic profile
122

144	LINE CARD VARIABLE	VALUE
146	SLOT #	
148	NUMBER OF PORTS	
150	REQUESTED NUMBER OF CHANNELS PER PORT	
152	REQUESTED TRAFFIC PROFILE INDICATOR PER CHANNEL	

FIG. 9

154	DSL PORT VARIABLE	VALUE
154	DSL PORT #	
156	MAX VPI	
158	MAX VCI	
160	STATUS	
162	CONFIGURATION PARAMETERS (# channels, ATM parameters, upstream and downstream rate table, etc.)	

FIG. 10

10818

166 BACKPLANE INTERFACE VARIABLE	VALUE
168 INTERFACE ID	
170 MAX VPI	
172 MAX VCI	
174 STATUS	
176 OTHER PARAMETERS	

FIG. 11

178 UPLINK INTERFACE VARIABLE	VALUE
180 INTERFACE ID	
182 MAX VPI	
184 MAX VCI	
186 STATUS	
188 OTHER PARAMETERS	

FIG. 12

190 CROSS-CONNECT VARIABLE	VALUE
192 CROSS CONNECT ID	
194 IFINDEX1	
196 VPI1	
200 VCI1	
202 IFINDEX2	
204 VPI2	
206 VCI2	

FIG. 13

210 **CROSS-CONNECTION TABLE**

212 UPLINK INTERFACE:VPI:VCI [UPLINK INTERFACE = Ifup = 1] [VPI0 ≤ VPI ≤ VPIm] [VCI0 ≤ VCI ≤ VCIm] [p = number of ports per card] [c = number of cards in system]	216 STATUS	214 BACKPLANE INTERFACE:VPI:VCI [IF1 ≤ BACKPLANE INTERFACE ≤ IFc] [VPI0 = fixed starting VPI] [VCI0 fixed starting VCI] [p = number of ports per card] [c = number of cards in system]
IFup:VPI0:VCI0		IF1:VPI0:VCI0
IFup:VPI0:VCI0+1		IF1:VPI0+1:VCI0
.		.
IFup:VPI0:VCI0+p-2		IF1:VPI0+p-2:VCI0
IFup:VPI0:VCI0+p-1		IF1:VPI0+p-1:VCI0
IFup:VPI0:VCI0+p		IF2:VPI0/ VCI0
IFup:VPI0:VCI0+p+1		IF2:VPI0+1:VCI0
.		.
IFup:VPI0:VCI0+p*2-2		IF2:VPI0+p-2:VCI0
IFup:VPI0:VCI0+p*2-1		IF2:VPI0+p-1:VCI0
.		.
IFup:VPI0:VCI0+p*(c-2)		IF2:VPI0/ VCI0
IFup:VPI0:VCI0+p*(c-2)+1		IF2:VPI0+1:VCI0
.		.

FIG. 14A

210 **CROSS-CONNECTION TABLE**

212 **UPLINK INTERFACE:VPI:VCI** [UPLINK INTERFACE = Ifup = 1] [VPI0 ≤ VPI ≤ VPIm] [VCI0 ≤ VCI ≤ VCIm] [p = number of ports per card] [c = number of cards in system]	216 **STATUS**	214 **BACKPLANE INTERFACE:VPI:VCI** [IF1 ≤ BACKPLANE INTERFACE ≤ IFc] [VPI0 = fixed starting VPI] [VCI0 fixed starting VCI] [p = number of ports per card] [c = number of cards in system]
IFup:VPI0:VCI0+p*(c-1)-2		IFc:VPI0+p-2:VCI0
IFup:VPI0:VCI0+p*(c-1)-1		IFc:VPI0+p-1:VCI0
IFup:VPI1:VCI1		IF1:VPI0:VCI1
IFup:VPI1:VCI1+1		IF1:VPI0+1:VCI1
.		.
IFup:VPI1:VCI1+p-2		IF1:VPI0+p-2:VCI1
IFup:VPI1:VCI1+p-1		IF1:VPI0+p-1:VCI1
IFup:VPI1:VCI1+p		IF2:VPI0/ VCI1
IFup:VPI1:VCI1+p+1		IF2:VPI0+1:VCI1
.		.
IFup:VPI1:VCI1+p*(c-2)		IF2:VPI0/ VCI1
IFup:VPI1:VCI1+p*(c-2)+1		IF2:VPI0+1:VCI1
.		.

FIG. 14B

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CROSS-CONNECTION TABLE

212 **UPLINK INTERFACE:VPI:VCI** [UPLINK INTERFACE = Ifup = 1] [VPI0 ≤ VPI ≤ VPIm] [VCI0 ≤ VCI ≤ VCIm] [p = number of ports per card] [c = number of cards in system]	216 **STATUS**	214 **BACKPLANE INTERFACE:VPI:VCI** [IF1 ≤ BACKPLANE INTERFACE ≤ IFc] [VPI0 = fixed starting VPI] [VCI0 fixed starting VCI] [p = number of ports per card] [c = number of cards in system]
IFup:VPI1:VCI1+p*(c-1)-2		IFc:VPI0+p-2:VCI1
IFup:VPI1:VCI1+p*(c-1)-1		IFc:VPI0+p-1:VCI1
.		.
IFup:VPIm:VCIm		IF1:VPI0:VCIc-1
IFup:VPIm:VCIm+1		IF1:VPI0+1:VCIc-1
.		.
IFup:VPIm:VCIm+p-2		IF1:VPI0+p-2:VCIc-1
IFup:VPIm:VCIm+p-1		IF1:VPI0+p-1:VCIc-1
IFup:VPIm:VCIm+p		IF2:VPI1/ VCIc-1
IFup:VPIm:VCIm+p+1		IF2:VPI2:VCIc-1
.		.
IFup:VPIm:VCIm+p*(c-2)		IF2:VPI0/ VCI0
IFup:VPIm:VCIm+p*(c-2)+1		IF2:VPI0+1:VCI0

FIG. 14C

220 VCL VARIABLE	VALUE
222 IFINDEX	
224 VPI	
226 VCI	
228 TRAFFIC PROFILE UP	
230 TRAFFIC PROFILE DOWN	

FIG. 15

232 AUTO-CONFIGURATION RECORD	
AUTO-CONFIGURATION VARIABLE	VALUE
234 INTERFACE ID	
236 CHANNEL	
238 BASE VPI	
240 BASE VCI	

FIG. 16

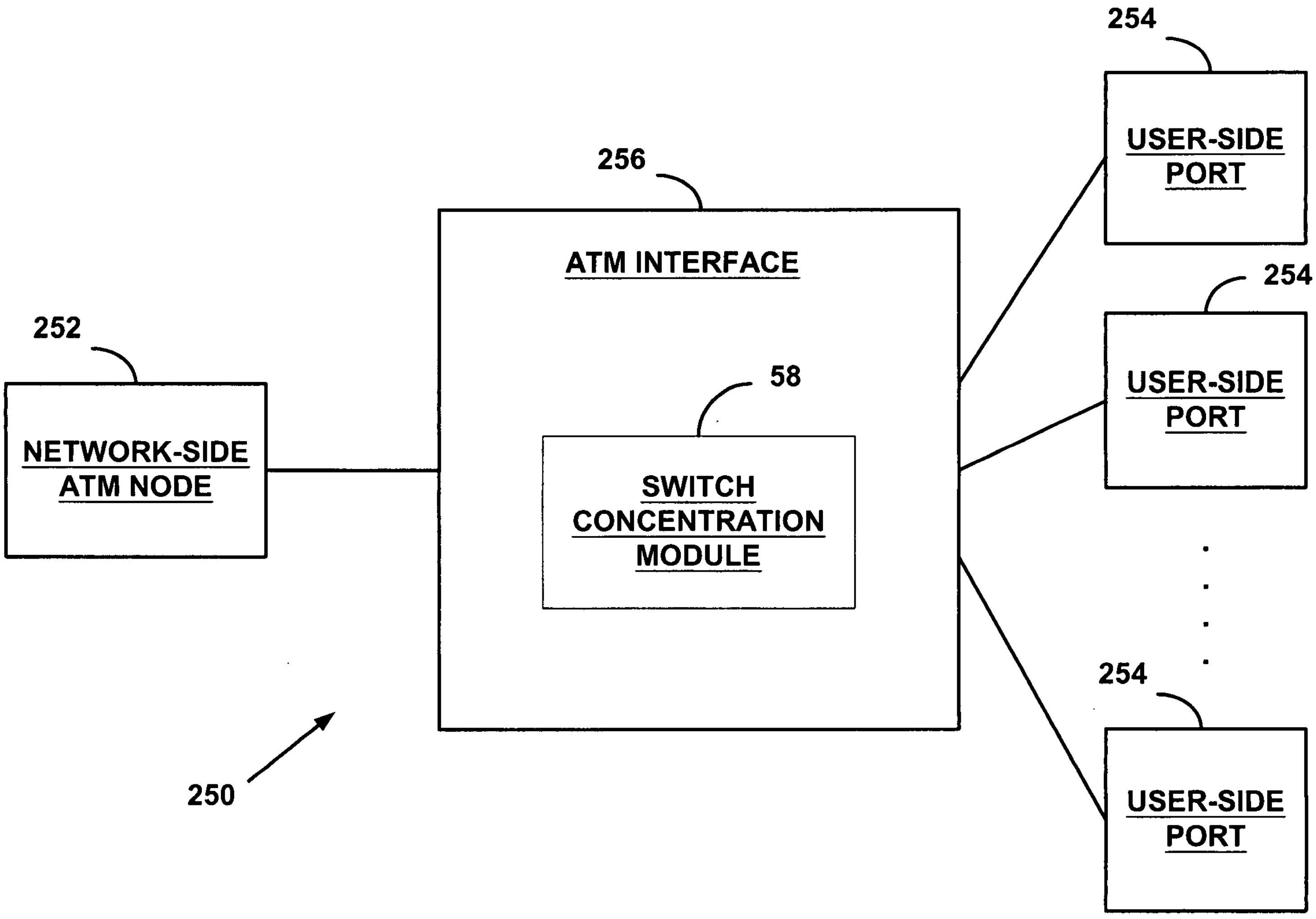

FIG. 17

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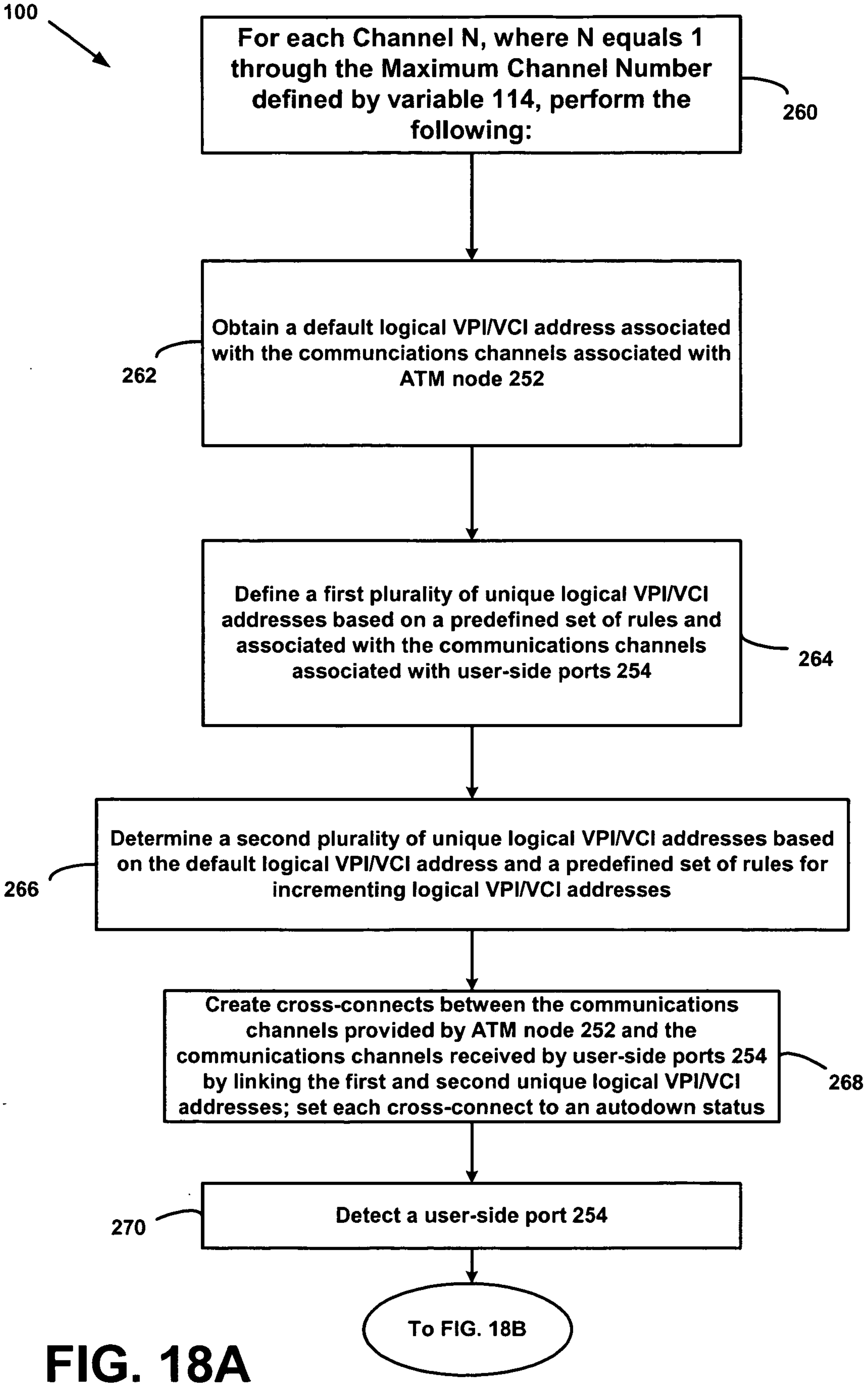
100
For each Channel N, where N equals 1 through the Maximum Channel Number defined by variable 114, perform the following:
260
Obtain a default logical VPI/VCI address associated with the communciations channels associated with ATM node 252
262
Define a first plurality of unique logical VPI/VCI addresses based on a predefined set of rules and associated with the communications channels associated with user-side ports 254
264
Determine a second plurality of unique logical VPI/VCI addresses based on the default logical VPI/VCI address and a predefined set of rules for incrementing logical VPI/VCI addresses
266
Create cross-connects between the communications channels provided by ATM node 252 and the communications channels received by user-side ports 254 by linking the first and second unique logical VPI/VCI addresses; set each cross-connect to an autodown status
268
Detect a user-side port 254
270
To FIG. 18B

FIG. 18A

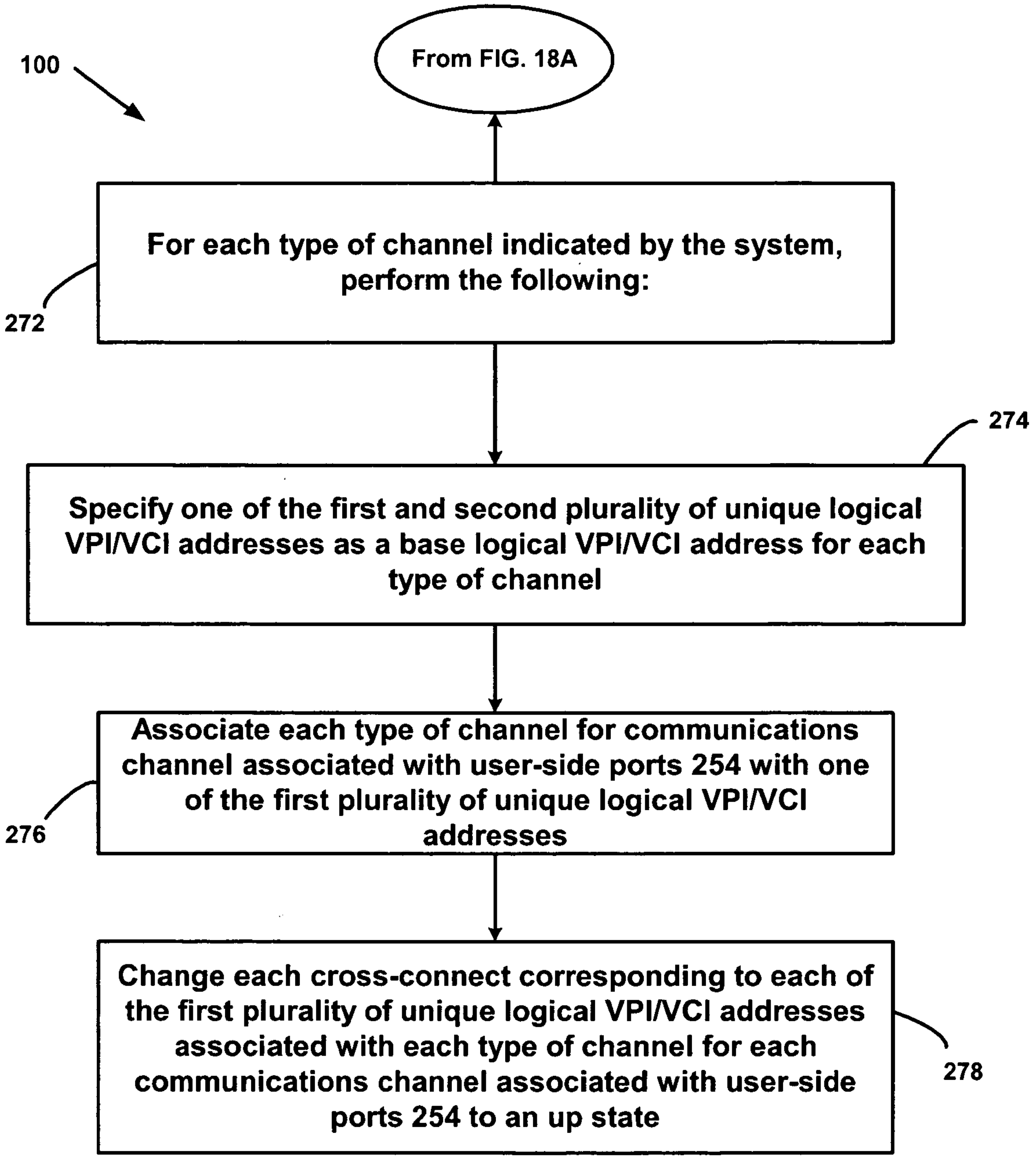
100
From FIG. 18A
For each type of channel indicated by the system, perform the following:
272
Specify one of the first and second plurality of unique logical VPI/VCI addresses as a base logical VPI/VCI address for each type of channel
274
Associate each type of channel for communications channel associated with user-side ports 254 with one of the first plurality of unique logical VPI/VCI addresses
276
Change each cross-connect corresponding to each of the first plurality of unique logical VPI/VCI addresses associated with each type of channel for each communications channel associated with user-side ports 254 to an up state
278

FIG. 18B